

Monofilament Vaporization Propulsion (MVP) System, Phase I

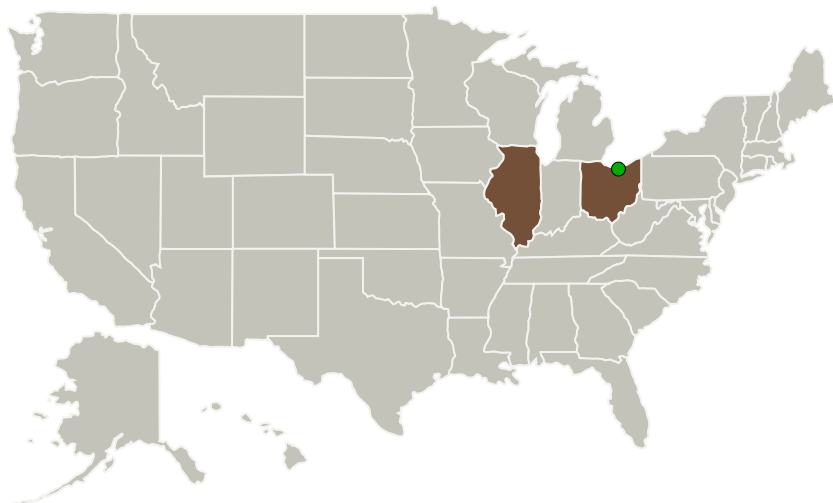
Completed Technology Project (2016 - 2016)




Project Introduction

Monofilament Vaporization Propulsion (MVP) is a new propulsion technology targeted at secondary payload applications. It does not compromise on performance while using safe, clean, propellant without storage or handling concerns. Potential issues with liquid propellants such as freezing and over-pressurization in the space environment do not apply to MVP as its propellant is a solid. MVP harnesses technology used in 3d printing applications to feed propellant into proven electrothermal propulsion technology developed by CU Aerospace to provide a safe and reliable system with high performance. The MVP concept accepts a variety of filament propellants, the leading candidate being a commercially available polymer. This should provide 900 N-s total impulse with a 1U (10 cm x 10 cm x 10 cm) system. This imparts 250 m/s Delta-V to a standard 4 kg, 3U CubeSat. Target power consumption for MVP is less than 15 W, and the target price for MVP is \$30K in order to encourage use on low budget missions.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
CU Aerospace, LLC	Lead Organization	Industry	Champaign, Illinois
 Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Monofilament Vaporization Propulsion

1U
900 N-s Total Impulse

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Primary U.S. Work Locations

Illinois

Ohio

Project Transitions

**June 2016:** Project Start**December 2016:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139862>)

Images



Briefing Chart Image

Monofilament Vaporization Propulsion (MVP) System, Phase I
(<https://techport.nasa.gov/image/133338>)



Final Summary Chart Image

Monofilament Vaporization Propulsion (MVP) System, Phase I
Project Image
(<https://techport.nasa.gov/image/137213>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

CU Aerospace, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

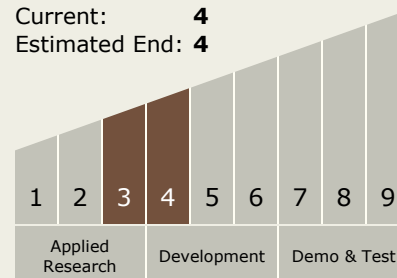
Carlos Torrez

Principal Investigator:

Curtis Woodruff

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.2 Electric Space Propulsion
 - └ TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System